

**UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK**

VIRTUAL SOLUTIONS, LLC,

Plaintiff,

v.

MICROSOFT CORPORATION,

Defendants.

Case No. 1:12-CV-0118-SAS (LED)

**DECLARATION OF AARON BOBICK, PH.D.**

I, Aaron F. Bobick, Ph.D., declare as follows:

1. I make this declaration at the request of counsel for Microsoft Corporation (“Microsoft”), and if called to testify as to the contents of the declaration would testify competently thereto.

2. My educational background, professional achievements, and qualifications as a Computer Scientist and as an expert in Computer Vision are detailed in my curriculum vitae, which is attached hereto as Exhibit A.

3. I earned BS degrees in both Computer Science and Mathematics in 1981 and a Ph.D. in Cognitive Science in 1987, all from the Massachusetts Institute of Technology. I was the founding Chair of, and am currently Professor in the School of Interactive Computing in the College of Computing of the Georgia Institute of Technology. Previously I served as Director of the Graphics, Visualization and Usability Center at Georgia Tech and prior to that served on the faculty of the MIT Media Laboratory.

4. Over the last twenty-five years, along with my students I have developed and written about a variety of interactive systems in which users interact with virtual characters.

These systems employed a variety of sensing methods including computer vision to determine the state and activities of the users. I have authored numerous book chapters, journal and conference papers, and technical reports in the area of computer vision as detailed in Exhibit A. I have served on the program committee and as an area chair for most of the premier computer vision conferences in the world including serving as Program Co-Chair of the IEEE Computer Vision and Pattern Recognition conference, the premier computer vision conference in North America.

5. Exhibit B provides a listing of cases in which I have been retained and/or testified as an expert at trial or in a deposition.

#### **I. THE '353 PATENT**

6. I have reviewed U.S. Patent No. 6,507,353 (“the ’353 patent”) and have developed certain opinions concerning the asserted claims.

7. In my opinion, for these claims, the relevant fields are the fields of interactive virtual reality systems and human activity sensing. A person of ordinary skill in these fields at the ’353 patent’s filing date would possess at least a Master’s degree in computer science or electrical engineering with several years of experience in the design of sensing and interactive virtual reality systems. One who possessed extraordinary experience in one of these areas could also be considered to have ordinary skill in the field, notwithstanding a deficit in the other area. I believe I possess at least the ordinary level of skill that one in the fields of sensing and interactive virtual reality systems would possess (both today and at the relevant date for the ’353 patent).

8. One of the recited elements of claim 1 is a “physical characteristic signal.” The claim requires a “physical characteristic signal including position information, wherein said physical characteristic signal provides information on visitor activity and location within said

theater area.” The claim also requires “analyzing said at least one physical characteristic signal, a change over time of said physical characteristic signal, and said behavior model for said at least one virtual actor to generate a behavior model for said at least one virtual actor to generate a behavior vector of said at least one virtual actor using said position information and said at least one physical characteristic signal.” I feel qualified to render an opinion concerning this limitation.

9. One of the recited elements of claim 8 is a “virtual environment stimulus generator.” I feel qualified to render an opinion concerning this limitation.

## **II. “PHYSICAL CHARACTERISTIC SIGNAL”**

10. I understand that the process of claim construction requires the court to make a determination as to the meaning of the term “physical characteristic signal.” I further understand that this determination is to be based in part on whether a person of ordinary skill in the art would be able to ascertain that term’s meaning and, if so, the meaning such a person would ascribe to the term. Having reviewed the claims’ use of the term “physical characteristic signal” closely, my opinion is that the claim includes such a logical contradiction as to this term’s meaning as to make valid interpretation of this term impossible.

11. Claim 1 recites the following two requirements for the term “physical characteristic signal.” First, it requires “interpreting sensor signals to provide at least one physical characteristic signal including position information.” This language unambiguously requires that “position information” be included in the “physical characteristic signal.”

12. Second, claim 1 requires that a behavior vector be generated “using said position information and said at least one physical characteristic signal.” This language unambiguously requires that “position information” be distinct from the “physical characteristic signal.”

13. The claims’ simultaneous requirement of two contradictory elements—that “position information” be both included in and distinct from the “physical characteristic signal”—makes it impossible to provide a meaningful interpretation to these claim terms. To understand the scope of the claimed invention, one of ordinary skill in the art would view it as critical to know the relationship between these two claim elements. The insoluble ambiguity presented by these two limitations makes it impossible for one of ordinary skill in the art to know whether a given technology is covered or not covered by the claim.

14. Furthermore, this logical contradiction in the claims cannot be cured by reference to the specification, file history, or the knowledge of one skilled in the art. The insoluble ambiguity is a consequence of contradictory claim language. It cannot be cured without amendment to the claims themselves.

### **III. “VIRTUAL ENVIRONMENT STIMULUS GENERATOR”**

15. I understand that the court will construe claim 8’s language “virtual environment stimulus generator, wherein said virtual environment stimulus generator analyzes said virtual environment database and generates a virtual environment stimulus” based in part on whether a person of ordinary skill in the art would find sufficient structure in the claim itself that performs the recited function. Having reviewed the claim closely, my opinion is that it does not recite structure that performs the function of analyzing the virtual environment database and generating the virtual environment stimulus.

16. As an initial matter, the term “virtual environment stimulus generator” describes only a function, and is not a well-known term in the art that connotes structure. Because the term has no well-known meaning, a person of ordinary skill in the art would look to define it entirely by the patent language. As discussed below, the sections of the ’353 patent referencing a “virtual

environment stimulus generator” do not describe any structure for performing the functions recited in claim 8.

17. The phrase “analyzes said virtual environment database” provides no guidance as to the nature of the analysis or that analysis’s role in generating the virtual environment stimulus. A person of ordinary skill in the art would be familiar with numerous ways in which to analyze a virtual environment database, and the claim gives no guidance with respect to this term. Without more structural detail in the claim about the “virtual environment stimulus generator,” one of ordinary skill would be unable to determine the boundaries of the claimed “virtual environment stimulus generator” or to find within the claim language any structure associated with the claimed function of “analyz[ing] said virtual environment database.”

18. The lack of structure associated with the “analyzes” function makes understanding the “generates” function equally problematic. The claim recites only the function of “generating” the virtual environmental stimulus, and fails to recite any structure that performs that function. The claim provides no guidance as to how the analysis of the database discussed above impacts, causes, or otherwise influences the generation of the virtual environment stimulus. Again, a person of ordinary skill in the art would know numerous ways in which the two steps could interact, and the claim gives no guidance with respect to this term. Without more structural detail in the claim about the “virtual environment stimulus generator,” one of ordinary skill would be unable to determine the boundaries of the claimed “virtual environment stimulus generator,” or to find within the claim language any structure associated with the claimed function of “generat[ing] a virtual environment stimulus.”

19. I have also reviewed the specification of the ’353 patent. I understand that the court may construe claim 8’s language “virtual environment stimulus generator, wherein said

virtual environment stimulus generator analyzes said virtual environment database and generates a virtual environment stimulus” according to disclosure in the specification of a structure that implements the claimed functions of “analyzing” and “generating” (if the specification includes such disclosure). Having reviewed the ’353 patent specification, it is my opinion that the specification does not disclose a structure that corresponds to the recited “virtual environment stimulus generator, wherein said virtual environment stimulus generator analyzes said virtual environment database and generates a virtual environment stimulus” limitation.

20. Reviewing the ’353 specification I find several references to a “virtual environment stimulus generator,” but whether taken individually or together these references do not disclose to one of ordinary skill in the art the structure to be used to perform the claimed functions. The specification states that “Virtual Environment Stimulus Generator 27 reads information from this database [the virtual environment database] in order to calculate the occurrence of random events such as the apparition of new actors, for example. Once the Virtual Environment Stimulus Generator 27 decides that a new actor should be created, a signal is sent to the new actor creation module 29.” [3:61–66.] This language does not describe how to calculate the occurrence of these random events based upon information in the virtual environment database. It provides no information about what it means to “calculate” such occurrences. It also does not describe how the decision that a new actor should be created is to be made. There is no disclosure of specific hardware, software, or algorithms for performing the functions of “analyzing” and “generating,” as they are recited in claim 8. I have also reviewed figure 2 of the ’353 patent, which depicts virtual environment stimulus generator 27, but again this figure gives no detail as to structure or algorithms corresponding to the claimed functions.

21. The '353 specification elsewhere states, "The virtual environment stimulus generator 52 computes random events and can create new actors. It can also generate a reaction using the reaction generator 56, which will be added 57 to the overall reaction generator 59. A new actor creator 60 uses the signal from the overall reaction generator 59 and the virtual environment stimulus generator 52 and decides on a reaction which is fed to the biophysical model action generator 62 of the new actor." [6:33–41.] Again, there is no disclosure here of any hardware, software, or algorithm to achieve the claimed functions. I have also reviewed figure 3 of the '353 patent, which depicts virtual environment stimulus generator 52, but again this figure gives no detail as to structure or algorithms corresponding to the claimed functions.

#### IV. CONCLUSION

22. In light of the foregoing analysis, it is my opinion that one of ordinary skill in the art would be unable to know the scope of the recited "physical characteristic signal" and the limitations containing this term in claim 1 of the '353 patent.

23. It is also my opinion that the '353 patent does not disclose to one of ordinary skill in the art structure corresponding to the "virtual environment stimulus generator" limitation. Therefore, one of ordinary skill in the art would be unable to determine the boundaries of this claim limitation.

24. I declare under the penalty of perjury under the laws of the United States that the foregoing is true and correct.

Respectfully submitted,

Dated: October 5, 2012

By: 

Aaron F. Bobick, Ph.D.